first and second semiconductor laser resonators provided on the same semiconductor substrate, an active layer of the first laser resonator being of a different material than an active layer of the second laser resonator;

the active layer of the second laser resonator being provided in a groove, whereas the active layer of the first laser resonator is not provided in a groove; and

a high-resistance region provided at least along a sidewall of the groove in which the active layer of the second laser resonator is provided, the high-resistance region comprising ions and/or protons implanted into the sidewall of the groove.

17. (*New*) The laser device of claim 16, wherein the active layers of the first and second resonators are of different materials at least because they contain different Group V elements.

REMARKS

This is in response to the Office Action dated April 1, 2002. Non-elected claims 12-15 have been canceled, without prejudice in view of the Restriction Requirement. New claims 16-17 have been added. Thus, claims 1-11 and 16-17 are now pending. Attached hereto is a marked-up version of the changes made to the claim(s) by the current amendment. The attached page(s) is captioned "**Version With Markings To Show Changes Made**."

For purposes of example and without limitation, certain example embodiments of this invention relate to a semiconductor laser device including multiple laser resonators. One laser resonator may emit light at a first wavelength, and another resonator may emit

light at a second wavelength. In order to emit the different wavelengths, the different laser resonators have active layers (i.e., light emitting layers) of *different materials*. In certain embodiments, the active layers of the different resonators have *different* Group V elements (e.g., P, As, Sb, N) (page 7, lines 11-19; and page 8, lines 3-24). For example, in the Fig. 1 embodiment, the active layer 113 of one resonator is of AlGaAs, whereas the active layer 122 of the other resonator is of GaInP (i.e., note the different Group V elements As and P). Moreover, a high resistance region (e.g., 141) is provided between the resonators in order to electrically isolate the resonators (page 9, lines 7-14; page 10, lines 6-19; and page 16, lines 3-6). In the Fig. 1 embodiment, for example, the high resistance region 141 may be formed by implanting Ga ions and/or protons into the sidewall of the groove 160 (page 16, lines 3-6). In certain embodiments, a current path can be formed in the high resistance region via impurity diffusion 142 (page 10, lines 15-19; and page 16, lines 8-12).

Claims 1, 4 and 6-9 stand rejected under 35 U.S.C. Section 102(e) as being allegedly anticipated by Motoda. This Section 102(e) rejection is respectfully traversed for at least the following reasons.

Claim 1 requires "<u>a plurality of semiconductor laser resonators having light emitting layers of *materials different from each other*</u>, the semiconductor laser resonators being provided on the same semiconductor substrate so that the light emitting layers lie substantially in parallel to a main surface of the semiconductor substrate, and a <u>high-resistance region</u> provided between the semiconductor laser resonators." Thus, claim 1 requires that the light emitting layers (i.e., active layers) of the different resonators be of

different materials. This enables the different resonators to emit different wavelengths in a desirable manner. Motoda fails to disclose or suggest this aspect of claim 1.

While Motoda discloses an array of lasers on the same substrate (e.g., see Fig. 36 of Motoda), the different lasers all have the *same type of active layer* whether it be a single layer or an MQW. Motoda's different lasers emit different wavelengths because their respective active layers are of different thicknesses due to Motoda's technique for etching (col. 29, line 41 through col. 30, line 5), and not because of different active layer materials. Thus, it is clear that Motoda *fails* to disclose or suggest the different light emitting layers (active layers) required for the different resonators as required by claim 1. Motoda is entirely unrelated to the invention of claim 1 in this regard, and cannot anticipate or otherwise render claim 1 unpatentable.

As a side-note, it is unclear what structure the Examiner believes is present in Motoda for meeting the "high resistance region" required by claim 1.

For at least the foregoing reasons, it is respectfully requested that all rejections be withdrawn. All claims are in condition for allowance. If any minor matter remains to be resolved, the Examiner is invited to telephone the undersigned with regard to the same.

Respectfully submitted,

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS

1. (*Unamended*) A semiconductor laser device comprising:

a plurality of semiconductor laser resonators having light emitting layers of materials different from each other, the semiconductor laser resonators being provided on the same semiconductor substrate so that the light emitting layers lie substantially in parallel to a main surface of the semiconductor substrate, and

a high-resistance region provided between the semiconductor laser resonators.

4. (*Amended*) The semiconductor laser device according to claim 1, wherein the semiconductor laser resonators [are constituted by] comprise two resonators having oscillation wavelengths in a red region and an infrared region, respectively.

10. (*Amended*) The semiconductor laser device according to claim 9, wherein the high - resistivity semiconductor layer is formed by implanting [a] protons or [a] gallium ions.

Please add the following new claims:

16. (*New*) A semiconductor laser device comprising:

first and second semiconductor laser resonators provided on the same semiconductor substrate, an active layer of the first laser resonator being of a different material than an active layer of the second laser resonator;

the active layer of the second laser resonator being provided in a groove, whereas the active layer of the first laser resonator is not provided in a groove; and

a high-resistance region provided at least along a sidewall of the groove in which the active layer of the second laser resonator is provided, the high-resistance region comprising ions and/or protons implanted into the sidewall of the groove.

17. (*New*) The laser device of claim 16, wherein the active layers of the first and second resonators are of different materials at least because they contain different Group V elements.

VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS

Please cancel claims 8 and 9.

1. (*Amended*) A semiconductor laser device comprising:

[a plurality of]first and second semiconductor laser resonators having different light emitting active layers of materials different from each other, the semiconductor laser resonators being provided on the same semiconductor substrate so that the light emitting active layers lie substantially in parallel to a main surface of the semiconductor substrate,

said first semiconductor laser resonator being located in a groove including a base and sidewalls, and said second semiconductor laser resonator not being located in said groove; and

a high-resistance region in a sidewall of said groove which is provided between the semiconductor laser resonators, said high-resistance region having sufficient resistance to electrically isolate the first and second semiconductor laser resonators from one another .

10. (*Amended*) The semiconductor laser device according to claim [9]1, wherein the high [-]resistivity [semiconductor layer]region comprises a high resistivity semiconductor layer [is]formed by implanting protons or gallium ions.

16. (*Amended*) A semiconductor laser device comprising:

first and second semiconductor laser resonators provided on the same [semiconductor]substrate, an active layer of the first laser resonator being of a different material than an active layer of the second laser resonator;

the active layer of the second laser resonator being provided in a groove, whereas the active layer of the first laser resonator is not provided in a groove; and

a high-resistance region provided at least along a sidewall of the groove in which the active layer of the second laser resonator is provided, the high-resistance region comprising ions and/or protons implanted into the sidewall of the groove.

Please add the following new claims:

18. (*New*) The semiconductor laser device of claim 1, wherein each of said first and second semiconductor laser resonators is mounted on a heat sink having a concave portion defined in a surface thereof, each of the semiconductor laser resonators being mounted in a junction-down manner on the heat sink so that in each semiconductor laser resonator a cap layer thereof is located between the heat sink and an active layer thereof, and wherein a sidewall of said groove extends upward from the concave portion defined in the surface of the heat sink.

19. (*New*) The semiconductor laser device of claim 16, wherein each of said first and second semiconductor laser resonators is mounted on a heat sink having a concave

portion defined in a surface thereof, each of the semiconductor laser resonators being mounted in a junction-down manner on the heat sink so that in each semiconductor laser resonator a cap layer thereof is located between the heat sink and an active layer thereof, and so that the active layer of each semiconductor laser resonator is located between said substrate and the heat sink, and wherein a sidewall of said groove extends upward from the concave portion defined in the surface of the heat sink.

20. (*New*) A semiconductor laser device comprising:

first and second semiconductor laser resonators having different light emitting active layers of materials different from each other, the semiconductor laser resonators being provided on the same substrate so that the light emitting active layers lie substantially in parallel to a main surface of the semiconductor substrate,

an isolating groove defined between the first and second semiconductor laser resonators for electrically isolating the first and second semiconductor laser resonators from one another;

each of said first and second semiconductor laser resonators being mounted on a heat sink having a concave portion defined in a surface thereof, and each of the semiconductor laser resonators being mounted in a junction-down manner on the heat sink so that in each semiconductor laser resonator a cap layer thereof is located between the heat sink and an active layer thereof, and so that the active layer of each semiconductor laser resonator is located between said substrate and the heat sink; and

wherein at least a portion of said isolating groove extends upward from the concave portion defined in the surface of the heat sink.